ABSTRACT OF THE DISCLOSURE

Diagnostic assistance to physicians is improved, by increasing detection rates of abnormal pattern candidates having radially extending linear structures, and decreasing false positive detection rates. A linear structure extracting means extracts linear structures from within radiation image of a subject. A linear concentration calculating means calculates linear concentrations of the extracted linear structures with respect to each pixel within the image. A directional distribution index calculating means calculates indices of directional distribution of the extracted linear structures with respect to each pixel of interest. A candidate region detecting means calculates products of the linear concentrations and the indices of directional distribution for each pixel of interest, and detects tumor pattern candidate regions based on the calculated products. Thereby, candidate regions are enabled to be extracted while taking into consideration variance in the directions of linear structures.